

County of Santa Clara Board of Supervisors

Supervisory District Four

Supervisor James T. Beall, Jr.



bosD4-9-14-04fcini

DATE: September 14, 2004

TO: Board of Supervisors

FROM:

A handwritten signature in black ink that reads "James T. Beall, Jr.".

James T. Beall, Jr.
Supervisor, District 4

SUBJECT:

Santa Clara County Fuel Cell Advancement Initiative

RECOMMENDED ACTION

a. Direct County Executive to consider stationary fuel cell applications when planning for building projects and energy-system upgrades. Build public/private partnerships to leverage resources to support R&D of fuel cells and clean hydrogen production efforts in Santa Clara County. Possible demonstration sites could include: county buildings, Fair Oaks Senior Housing Project, sewage treatment plants, and Office of Emergency Services (OES) center. Apply for grants to support stationary fuel cell demonstration projects.

b. Direct County Executive to identify a fuel cell vehicle (FCV) demonstration project. Work with California Fuel Cell Partnership to develop an interest among FCV manufacturers to lease demonstration vehicles to the county. Identify clean and efficient hydrogen refueling infrastructure. Apply for grants to support a fuel cell fleet vehicle demonstration project.

c. Direct administration to contract with a consultant specializing in energy and transportation engineering to assist the county with implementation of the above recommendations. Apply for planning grants to fund consultant services.

d. Direct the Legislative Committee to consider sponsoring legislation related to: hydrogen and fuel cell technology expansion and advancement; and consumer incentives for low- and zero-emissions vehicles, photovoltaic and other clean, distributed generation applications.

e. Direct County Executive to participate in local and regional information-exchange forums of public and private stakeholders to educate, and leverage resources to support the advancement of a local hydrogen economy. Work with California Hydrogen Highway Network to include county fuel cell and hydrogen efforts as a model in the Governor's Hydrogen Highways Blueprint Plan.

FISCAL IMPLICATIONS

No General Fund Impact.

Numerous grant and funding sources are available for fuel cell vehicle demonstration and stationary fuel cell infrastructure planning and capital projects. Some of which include:

- BAAQMD Transportation for Clean Air Grant
- U.S. Department of Energy
- Caltrans Transportation Planning Grants
- California Energy Commission Buy-down Program
- California Public Utilities Commission Self-Generation Program
- The Energy Foundation
- Steven and Michele Kirsch Foundation
- CSAC Bond Programs

REASONS FOR RECOMMENDATION

As the country is moving forward on the road to a hydrogen economy, it is important that the County of Santa Clara position itself for the future – as one of the leading regions supporting emerging clean energy and transportation technologies.

Hydrogen is often characterized as the "ultimate fuel of the future" being both clean and available without the need for energy imports. It has an unmatched potential to bring about economic stability, energy reliability, environmental, and public health benefits. Promising technological breakthroughs are occurring every day throughout the world and within our own backyard.

There is substantial action that governments and other stakeholders can and must take if a transition is to be made in a timely manner to a cleaner and more sustainable energy system. A key step in this process is to conduct demonstration projects, which are essential for identifying and resolving real-world operating issues. They also provide valuable lessons in siting and permitting infrastructure and serve as pilot projects for introducing new technologies and fuels into early markets.

BACKGROUND

Economic Development

Using hydrogen as an energy carrier will require a variety of new technologies, products and services, such as stationary fuel cells for co-generation distributed energy systems, fuel cells for transportation applications, and hydrogen refueling stations. This means economic development opportunities for local companies and new high-technology jobs. This will lead to the creation of high-tech jobs to build and maintain these systems. Although the transition to a hydrogen economy will take decades, faster transitions can occur in particularly progressive regions (Dr. Dan Sperling, UC Davis Institute of Transportation Studies. Hydrogen Conference, August 2004).

Health Implications

Production, sales and use of petroleum-derived fuels in the U.S. emit thousands of tons of chemical pollutants into the air each day. Widespread use of fuel cell vehicles could have a measurable effect on air quality by reducing nitrogen oxides, volatile organic compounds, and particulate matter produced by vehicles. Petroleum pollutants can cause or aggravate a wide range of serious health problems including cancer, birth defects, asthma, and chronic obstructive pulmonary disease. Both nationally and at the county level, we have seen the impact of air pollution on health.

As the attached chart illustrates, asthma deaths have been increasing over the past 25 years. I believe initiatives that seek to improve air quality are important and a first step towards reducing the incidence of asthma in our region. Clearly, adoption of a few zero-emissions fleet vehicles and a handful of stationary fuel cell projects are not going to address the health concerns in isolation, but leadership and building public awareness is critical to advancement towards this goal (Attachment A).

Economic Risks Associated with Petroleum Dependency and Availability

The support of non-petroleum fuels, such as hydrogen, offers an opportunity for County citizens to be able to seek alternatives to gasoline and diesel. This opportunity is important due to the economic risks of petroleum fuel price spikes and potential fuel supply shortfalls.

Hydrogen Production Pathways

Hydrogen – the most plentiful gas in the universe – can be produced from a wide variety of resources including coal, oil, natural gas, bio mass, and water. Several methods of producing hydrogen are currently in use or being explored. Most of the hydrogen used today comes from reforming natural gas offsite, then transported in pressurized tubes and stored in carefully controlled settings.

A small amount of hydrogen used today is produced onsite through electrolysis. Some fuel cells can run in reverse and produce hydrogen as needed via electrolysis. In electrolysis, electricity is used to separate water (H₂O) into hydrogen (H₂) and oxygen (O₂). The electricity can come from fossil fuels such as coal, or from renewable sources such as solar, hydroelectric or wind power.

Manufacturers throughout the U.S. and Canada are developing more efficient and cost-effective fuel cell and hydrogen production technologies every day. One manufacturer in Santa Clara County is developing an efficient, secure and cost-effective stationary fuel cell technology that produces electricity or hydrogen as needed, and will be available for demonstration projects within the next year.

Statewide Initiative

Governor Schwarzenegger's Executive Order S-7-05 California Hydrogen Highways Network calls for a blueprint plan to implement a network of hydrogen refueling stations along California's major highways by 2010. In the Executive Order, the governor states: "hydrogen powered vehicles and infrastructure can lead to energy independence, offer zero or near-zero emissions, reduce health problems due to motor vehicle related air pollution, reduce water pollution from oil and gasoline leaks, lower global warming pollution, improve fuel economy, provide smoother and quieter operation, as well as providing economic and workforce benefits to help California meet current and future energy needs".

Local Initiatives

The Santa Clara Valley Transportation Authority (VTA), in partnership with the San Mateo County Transit (SamTrans), is conducting a demonstration program to test hydrogen-powered fuel cell buses. Starting in January, VTA will operate three zero-emissions buses on selected routes within Santa Clara County. The liquid hydrogen fueling station is located at VTA's Cerone Station.

Santa Clara County has demonstrated leadership in early adoption of clean-fuel technology in our fleet program and should continue to do so as new technologies emerge. In County policy 7.11 Vehicle Procurement – Low Emission Vehicles, the Board of Supervisors adopted a policy to encourage low emission vehicles. I believe that we should aggressively extend our program to zero emissions hydrogen vehicles. Board Policy 7.11 states, "The County will identify and give preference in its vehicle procurement to the acquisition of the lowest emission vehicles available, practical, and reasonably cost effective for a given application, or where funding is available to assure that such vehicles are reasonably cost competitive. Public safety and emergency vehicles are exempt from this policy".

It is anticipated that the next round of FCV fleet customers will be identified in Spring 2005. Collectively, auto manufacturers are estimating that by 2007 approximately 200–300 demonstration FCVs will be spread between major metropolitan areas of the State. Each carefully selected customer will receive between one and five vehicles.

There are opportunities to collaborate with one of our affordable housing partners – Charities Housing – to build a stationary fuel cell demonstration project at the Fair Oaks Senior Housing site. This demonstration project could potentially include a fuel cell shuttle vehicle for the residents' transportation needs. The potential combination of both a stationary fuel cell system providing electricity, water, heating, cooling and fuel for a zero-emissions shuttle would set a nationwide precedent.

The Governor's California Hydrogen Highways Team is looking for a county model to include within the Blueprint Plan. I believe that we have the opportunity to do what we do best here in Santa Clara County – establish innovative public-private partnerships that deliver quality services to the public. Furthermore, I believe that we can lead the nation with such an initiative, supporting the diffusion of a clean, reliable and sustainable energy technology that will eventually create jobs, improve air quality, and hence improve public health.

CONSEQUENCES OF NEGATIVE ACTION

Recommendations will not be adopted and county will not be in a position to compete for state and federal grant funding for fuel cell projects.

ATTACHMENTS

- (Transmittal submitted on Sep 8, 2004 9:40:28 AM – PDF Version)
- Attachment A – An Integrated Hydrogen Vision for California (Miscellaneous)
- Attachment B – An Integrated Hydrogen Vision for California (Miscellaneous)